

REMARKS

Claims 1-40 were originally filed. Claims 1, 3, 5, 9-13, 16-18, 25, 32-33, and 38-40 have been amended. Claim 2 has been cancelled. New claims 41-47 have been added. Claims 1 and 3-47 are now pending.

Independent claims 1, 18, 25, and 38 have been amended to clarify that the total volume is calculated, and that a value for the total volume is determined. Claims 1, 18, 25, and 38 have also been amended to require a second total volume of the item to be calculated after an event. Support for these amendments is found throughout the specification, illustratively at pages 9-14.

Claim 1 has been further amended to incorporate the subject matter of dependent claim 2. Accordingly, claim 2 has been cancelled, and dependent claims 3, 16, and 17 have been amended to depend from claim 1. Claims 5 and 9-13 have also been amended for consistency with the amendments to independent claim 1. Claim 5 has been further amended to correct a typographical error in the equation. Support for this correction is found in the specification on page 11. Dependent claim 11 has been further amended for clarification purposes. Support for the amendment to claim 11 is found in the paragraph bridging pages 13-14.

Claims 32-33 have been amended for consistency with the amendments to independent claim 25.

Independent claim 38 has been further amended to incorporate the subject matter of dependent claim 39. Claim 39 has been amended for consistency with the amendment to claim

38 and to specify calculating an intensity slope. Support for this amendment is found on page 11. Claim 40 has been amended for consistency with the amendments to claims 38 and 39.

New claim 41 depends from claim 1 and requires an intensity slope to be calculated. Support for new claim 41 is found in the specification at page 11.

New claim 42 is directed to the subject matter of original claim 5, as amended for clarification purposes, and written in independent form and including all limitations of the base claim and all intervening dependent claims. New claim 43 is directed to the subject matter of original claim 11, as amended for clarification purposes, and written in independent form and including all limitations of the base claim and all intervening dependent claims. New claim 44 is directed to the subject matter of original claim 17, written in independent form and including all limitations of the base claim and all intervening dependent claims. New claim 45 is directed to the subject matter of original claim 30, written in independent form and including all limitations of the base claim and all intervening dependent claims. New claim 46 depends from claim 45 and is directed to the subject matter of original claim 31. New claim 47 is directed to the subject matter of original claim 37, written in independent form and including all limitations of the base claim and all intervening dependent claims. No new matter is added by way of these amendments.

In response to the objection to the drawings, substitute drawings are enclosed.

Claims 1 and 2 have been rejected under 35 U.S.C. § 102(b) as being anticipated by Zahavi (U.S. Patent No. 5,592,563). According to the Examiner, Zahavi discloses a measuring

device comprising a camera adapted to generate images of an item being measured and a processor operatively associated with the camera adapted to calculate the volume of the item based on the images. With respect to claim 2, the Examiner finds that the processor of Zahavi is adapted to identify an outline of the item and divide the outline into a plurality of two dimensional slices.

While Zahavi teaches a device for generating images of an object using a camera, the teachings of Zahavi are directed toward surface imaging of the object. While Zahavi speaks in terms of volume, this is the three-dimensional space occupied by a particular surface of the object. A “virtual volume” is created in three dimensions (col. 4, lines 37-41), and this space may be magnified a number of times, if desired. While certain calculations are made for imaging purposes, the teachings of Zahavi are directed toward imaging the surface of the object and Zahavi does not teach or suggest calculating a value for the total volume of the item, as required by claim 1, as amended. Additionally, Zahavi does not base its calculations on two-dimensional slices of the object, as required by amended claim 1. Instead, Zahavi clearly uses in-focus and out-of-focus information of three-dimensional slices of the object to image the three-dimensional object. Furthermore, Zahavi does not teach a comparative measuring device involving calculating a second total volume of the item generated from a second set of images of the item after an event, as required by amended claim 1. Accordingly, applicants respectfully request withdrawal of this rejection.

Claims 3, 4, 6, 18-21, 25-29, and 38-40 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Zahavi, as applied to claims 1 and 2 above, and in further view of King

et al. (U.S. Patent No. 5,233,518). King discloses a method of image helical scanning. The Examiner points to King for disclosure of various features of claims 3, 4, 6, 18-21, 25-29, and 38-40.

Applicants respectfully note that each of claims 3, 4, 6, 18-21, 25-29, and 38-40 require a value for the total volume for the item to be calculated. As with Zahavi, King is directed to imaging of an item, not determination of a value for the total volume of the item. Neither Zahavi nor King, alone or in combination, teaches or suggests calculating the total volume of the item. Applicants respectfully submit that the combination of Zahavi and King does not render obvious claims 3, 4, 6, 18-21, 25-29, and 38-40. Furthermore, as amended, each of these claims require calculation of a second total volume, either after an event or after a change in volume of the item. Neither Zahavi nor King teach a device that calculates a second volume of the item. Accordingly, applicants respectfully request withdrawal of this rejection.

Claims 7-8, 16, and 22-24 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Zahavi in view of King, as applied to claims 1-4, 6, 18-21, 25-29, and 38-40, and further in view of Stansbury et al. (U.S. Patent No. 6,184,339 B1). According to the Examiner, Stansbury discloses acrylate resins with moderate to high organofluorine contents, that are curable to form high strength polymeric networks. According to the Examiner, the system of Stansbury comprises a device including an isolation chamber, with a rotatable platform positioned within the isolation chamber. The Examiner concludes that it would have been obvious to one of ordinary skill in the art at the time of the invention to have modified Zahavi to include an isolation chamber, wherein the rotatable platform is positioned within the isolation chamber.

As noted by the Examiner, the disclosure of Stansbury is directed to various acrylate resins. While Stansbury teaches measuring the volume of items made from these resins to measure shrinkage after curing, the volume measurements were made with a mercury dilatometer (col. 17, lines 59-64; col. 41, lines 20-53; Fig. 1). A mercury dilatometer measures volume based on the amount of mercury displaced by the item's volume. As discussed in the present specification at page 2, a mercury dilatometer operates by measuring the amount of mercury that is displaced by the sample volume within a sample chamber. The volume of mercury is determined by weighing the displaced mercury. In contrast, the present invention uses a camera and the images obtained therefrom to calculate the volume. There is simply no suggestion in Stansbury to calculate total volume using anything other than a mercury dilatometer, and there is certainly no suggestion to calculate volume using images of the item obtained from a camera. Applicants respectfully submit that none of Zahavi, King, or Stansbury, alone or in combination, teach or suggest using images generated from a camera for calculating the total volume of an item and obtaining a value for that total volume. Accordingly, applicants respectfully request withdrawal of this rejection.

Claims 9-10, 12-16, and 32-36 also stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Zahavi in view of King, and further in view of Stansbury. As noted above, Zahavi and King are directed to imaging devices. While both Zahavi and King teach making calculations based on information obtained from images of the item, the calculations in Zahavi and King are for imaging purposes, and these references are limited in their teachings to imaging techniques. There is simply no suggestion in Zahavi or King, alone or in combination, to obtain

a total volume of an item based on the information obtained from the images of that item. As discussed above, while Stansbury teaches measuring the volume of items made from the disclosed resins to measure shrinkage after curing, the volume measurements were made with a mercury dilatometer. The camera in Stansbury is used for imaging, not for calculation of volumes and there is no suggestion in Stansbury for using the camera to calculate volume measurements. Since each of the rejected claims, as amended, requires calculating or determining the total volume of the item both before and after an event or change in volume of the item, applicants respectfully submit that none of Zahavi, King, or Stansbury, alone or in combination, teach or suggest the invention as defined by claims 9-10, 12-16, and 32-36. Accordingly, applicants respectfully request withdrawal of this rejection.

Applicants note that the Examiner has found that claims 5, 11, 17, 30, 31, and 37 contain allowable subject matter. It is noted that new claims 42-45 and 47 are directed to the subject matter of original claims 5, 11, 17, 30, and 37, respectively, but written in independent form including all of the limitations of the base claim and any intervening claims. New claim 46 is directed to the subject matter of original claim 31, except new claim 46 depends from new claim 45. Applicants respectfully request allowance of these claims.

CONCLUSION

For all the foregoing reasons, it is respectfully submitted that the Applicants have made a patentable contribution to the art and that this response places the above-identified application in

condition for allowance. Favorable reconsideration and allowance of this application is respectfully requested.

A check in the amount of \$951.00 is enclosed, including \$475 for a three-month extension of time, \$296.00 for additional claim fees, and \$180 for submission of an information disclosure statement under 37 C.F.R. § 1.97(c). In the event the Applicants have inadvertently overlooked the need for payment of an additional fee, the Applicants conditionally petition therefor, and authorize any fee deficiency to be charged to deposit account 09-0007.

Sincerely,

ICE MILLER



Jill T. Powlick
Attorney Registration No. 42,088
ICE MILLER
One American Square, 31st Floor
Indianapolis, Indiana 46204
Telephone: (317) 236-5972
Facsimile: (317) 592-4610

Date: 27 sept 04

Enclosures: Check in the amount of \$951.00
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